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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/031,963	01/22/2002	Ching-Chian Chang	DN1999186USA	8113
7590	06/17/2004			
EXAMINER				
MAKI, STEVEN D				
ART UNIT		PAPER NUMBER		
1733				

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/031,963	CHANG ET AL.	
	Examiner Steven D. Maki	Art Unit 1733	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-10 and 15 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 012202.
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

1) The pending claims are claims 1-15 which replaced original claims 1-22 by

Article 34 amendment.

2) Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-10 and 15, drawn to a method / pneumatic tire.

Group II, claim(s) 11-14, drawn to an apparatus.

The inventions listed as Groups I, II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

Group I (but not Group II) contains the special technical feature of the gate having a gap height larger than the average length of the fiber, the viscosity of the elastomer being maintained at a Mooney viscosity of 30 to 80, the elastomer being processed at a speed of 100 to 1000 mm/sec linear speed at the gate and 1 to 100 mm/sec in the expansion cavity and the orientation of the fibers being maintained as it folds in the expansion cavity.

Group II (but not Group I) contains the special technical feature of a chamber for containing an elastomer, a ram for pressing elastomer through sprue, a pneumatic arm associated with a moving mold and a fixed mold attached to end of injection mold, having die plate disposed therebetween.

During a telephone conversation with Nancy Krawczyk on 6-2-04 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-10 and 15. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

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3) Claim 15 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n).

4) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5) Claims 1-10 and 15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is unclear how "whereby, if" in step (b) affects the scope of the claim. In particular, it is unclear if the recitation of "whereby, if" means that claim 1 reads on a gate which is not long enough so that the length direction of the fibers are not oriented in the direction of the gate length.

In claim 1 step (b), "leaves gate" should be --leaves the gate--.

In claim 1 step (e), "folds in expansion cavity" should be --folds in the expansion cavity--.

In claim 1, there is no antecedent basis for "the elastomer extrusion (17) that exits expansion cavity (14)" and, as such, it is unclear if an extruding step and/or a step of exiting the cavity is required and it is unclear if the elastomer extrusion is the component or something else.

Claim 1 step (e) refers to "the fibers in the ribbon" whereas step (a) does not describe the "fiber reinforced elastomer" as having fibers (plural). In step (a), it is suggested to insert -- comprising elastomer and fibers-- before ",".

In claim 1 step (f), "average length of said fiber" should be --average length of said fibers--.

In claim 2 line 3, "attaching die" should be --attaching the die--.

In claim 2, it is unclear if the description of "polymer" changes the scope of claim

1. In claim 2, it is suggested to change "polymer" to --the fiber reinforced elastomer--.

In claim 2, it is unclear if the "extrudate (17)" is the same as "said component". It is suggested to change "extrudate (17)" to --said component--.

In claim 4, it is unclear if the description of "polymer" changes the scope of claim

1. In claim 4, it is suggested to change "polymer" to --the fiber reinforced elastomer--.

In claim 4, the step of applying a clamp force is ambiguous. What is being clamped to what? Is the pneumatic arm separate from or part of the injection mold?

In claim 5 last line, "()" should be --(--.

In claim 6, the relationship, if any, between the die of claim 6 and the die of claim 1 is unclear. It is suggested to (1) change "attaching an expanding die (11a) having a tapered runner (22) to" to --attaching the die to-- and (2) after "the end (31) of extruder (30)" insert --wherein the die comprises a tapered runner, the tapered runner being located between the extruder and the gate--.

In claim 6, it is unclear if the "extrudate (17a)" is the same as "said component". It is suggested to change "extrudate (17a)" to --said component--.

Claim 7 refers to clamping pressure. What is being clamped to what?

In claim 8, it is unclear if another expansion cavity is being claimed. It is suggested to change "the further step of providing an expansion cavity (14) having" to

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--wherein the expansion cavity (14) has--.

In claim 1 step (f), during which step is the viscosity maintained as specified?

Claim 9 contains the trademark/trade name Kevlar. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe aramid and, accordingly, the identification/description is indefinite.

- 6) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 7) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 8) **Claim 15 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chang et al (WO 98/13185).**

Chang et al discloses a method for forming a fiber / rubber composite comprising:

providing a mold assembly 10 having first and second mold members 12, 14 which cooperate to form a mold cavity 20 having a "height" (thickness) T1;

"feeding" (injecting) a portion of "fiber reinforced elastomer" (molding compound comprising elastomeric material) and reinforcing fibers through an inlet gate 24 having a "height" (thickness) of t1 such that a majority of the fibers are oriented parallel to a direction of flow in the inlet gate;

directing the portion of the fiber reinforced elastomer into a first region of the mold cavity such that (a) the portion of fiber reinforced elastomer forms a series of folding planes perpendicular to the direction of flow in the first region and (b) a majority of the fibers are oriented in a direction perpendicular to the direction of flow.

Chang et al teaches using the fiber / rubber composite in a pneumatic tire.

As to the gate having a gap height larger than the average length of the fiber, Chang et al teaches that the fibers have a length of 0.1 to 1000 microns (0.0001-1 mm). See page 2 line 6, page 7 line 17, page 10 line 23. Chang et al further teaches that the gate has a height t1 less than 10% of the cavity height T1. Chang et al explicitly describes a gate height t1 of 0.4 mm. See page 6 lines 21-31. Hence, Chang et al teaches using a gap height (0.4 mm) larger than the fiber length (0.0001 mm).

Alternatively or additionally, the description relating to the gate height being larger than the fiber length fails to require fiber reinforced elastomer component (having a degree of

fiber orientation) different from that disclosed by Chang et al. See MPEP 2113 (Product by Process Claims)

The description of (a) the viscosity of the elastomer being maintained at a Mooney viscosity of 30 to 80 and (b) the elastomer being processed at a speed of 100 to 1000 mm/sec linear speed at the gate and 1 to 100 mm/sec in the expansion cavity fails to require a different fiber reinforced elastomer component different from that disclosed by Chang et al. See MPEP 2113.

The claimed pneumatic tire having a fiber reinforced elastomer component is anticipated by Chang et al. In any event: It would have been obvious to one of ordinary skill in the art to use Chang et al's process such that the resulting tire satisfies the requirements of the product by process tire of claim 15 since (1) Chang et al teaches orienting reinforcing fibers in elastomer in one direction and then folding the elastomer portion so as to obtain perpendicular fibers and (2) Chang et al teaches using the fiber reinforced component in a pneumatic tire.

9) **Claims 1-10 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chang et al in view of Gorter et al (US 4014969) and Goettler et al (US 4056591) and optionally at least one of Japan '924 (JP 1-304924) and Itoh et al (US 5702546).**

Chang et al is discussed above.

As to claims 1 and 15, it would have been obvious to one of ordinary skill in the art to *optimize* Chang et al's process such that

(a) the gate has a gap height larger than the average length of the fiber;

(b) the viscosity of the elastomer is maintained at a Mooney viscosity of 30 to 80

and

(c) the elastomer is processed at a speed of 100 to 1000 mm/sec linear speed at the gate and 1 to 100 mm/sec in the expansion cavity

depending on the desired degree of fiber orientation since (1) Chang et al, directed to the tire art, teaches **flowing** the elastomer through the gate (having a height such as 0.4 mm) such that the fibers are oriented in the flow direction and **folding** the portion of elastomer having the oriented fibers such that the fibers (having a length as low as 0.0001 mm) are oriented perpendicular to the flow direction; (2) Chang et al teaches that parameters that affect fiber orientation include gate dimensions, offset distance, molding temperature, etc. (page 8) and (3) Gorter et al and Goettler et al, also directed to orienting fibers in elastomer, teach one of ordinary skill in the tire art that parameters that affect fiber orientation include processing viscosity, fiber size and flow rate (see Gorter et al at col. 3 lines 1-25 and Goettler et al at col. 2 line 65 to col. 3 line 13).

As to collecting, one of ordinary skill in the art would readily understand that the fiber rubber composite made by Chang et al's process "exits the die and is collected" (removed from the die) so that it can be incorporated in a product such as a tire as described at pages 9-10. In any event: it would have been obvious to allow the fiber rubber composite to exit the die so that advantageously the fiber reinforced composite is formed continuously in view of Japan '924 and/or Itoh et al's teaching to continuously form a fiber reinforced rubber composite having oriented fibers therein by allowing the fiber reinforced composite to exit the die in which fibers are oriented in a desired

manner (see figures and abstract of Japan '924 and at least the prior art figure 1 process of Itoh et al).

As to the dependent claims: As to claim 2, it would have been obvious to use an injection mold as claimed since (1) Chang et al teaches using an injection mold to feed fiber reinforced elastomer into the die, (2) an injection mold (means for injecting elastomer into a die cavity) having a ram is taken as well known / conventional per se and optionally (3) Japan '924 and/or Itoh et al suggests attaching a feeding means to an orienting means. The limitation of collecting on a roll (claim 2) / using a scrim (claim 3) would have been obvious since (1) Chang et al suggests using the fiber reinforced composite as a tread and (2) it is taken as well known / conventional per se in the tire art to continuously form a tread by extrusion, apply a release layer ("scrim") to the tread and collect the tread on a roll wherein the release layer prevents the tread from sticking to itself on the roll. The processing conditions as set forth in claims 4 and 5 would have been obvious in view of the above noted teachings in Chang et al, Gorter et al and Goettler et al relating to parameters affecting fiber orientation. In claim 5, it would have been obvious to clamp as claimed since (1) Chang et al forms the die cavity using two mold members and (2) it is taken as well known / conventional per se to clamp two mold members together using a hydraulic cylinder / piston in order to maintain formation of the die cavity therein. As to claims 6 and 7, it would have been an obvious alternative to use an extruder instead of the injection mold in view of Japan '924 and/or Itoh et al's teaching to use an extruder having a tapered inner portion to feed fiber reinforced rubber to an orienting means. As to claim 8, Chang et al teaches that the expansion

cavity has a height T1 at least 10 times the height t1 of the gate. As to claim 9, it would have been obvious to use "Kevlar" fibers as claimed since Chang et al teaches that Kevlar fibers may be used as the reinforcing fibers. As to claim 10, it would have been obvious to use the claimed length for the expansion cavity in view of Japan '924 and /or Itoh et al's teaching to allow oriented fiber reinforced composite material to exit an orienting means.

Remarks

- 10) The remaining references are of interest.
- 11) No claim is allowed.
- 12) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Steven D. Maki
June 12, 2004

Steven D. Maki
6-12-04
STEVEN D. MAKI
PRIMARY EXAMINER
GROUP 1300
A# 1733